

Amendment and Response Under 37 C.F.R. §1.116 - Expedited Examining Procedure
Serial No.: 10/034,696
Confirmation No.: 1502
Filed: December 27, 2001
For: SURVEILLANCE SYSTEM AND METHODS REGARDING SAME

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Remarks

The Office Action mailed 22 July 2005 has been received and reviewed. Claim 2 has been amended. It is noted that claims 3, 7, 11, 14, 18, 22, 25, and 32 have been cancelled and not withdrawn as shown in the Office Action Summary. Therefore, the pending claims are claims 1-2, 4-6, 8-10, 12-13, 15-17, 19-21, 23-24, 26-31, and 33-43. Reconsideration and withdrawal of the rejections are respectfully requested in view of the amendments and remarks provided herein.

Claim Objections

The Examiner objected to claim 2 under 37 C.F.R. §1.75(a) as failing to particularly point out and distinctly claim the subject matter which the applicant regards as his invention of discovery. Claim 2 has been amended to clearly indicate that the physical marks correspond to the plurality of landmark points of commonality. Therefore, such objection to claim 2 is believed to be overcome.

It is noted that physical marks as described in the specification are selections physically marked in the defined search area during installation of the imaging devices; such a physical marking of the defined search area is not described in any of the references cited.

It respectfully requested that the objection be withdrawn.

The 35 U.S.C. §103 Rejection

The Examiner rejected claims 1-2, 4-6, 8-10, and 12-21 under 35 U.S.C. §103(a) as being unpatentable over Uytendaele (U.S. Patent No. 6,701,030) in view of Kanatani ("Optimal Homography Computation with a Reliability Measure", IAPR Workshop on Machine Vision Applications, Nov. 17-19, 1998) and Hansen (U.S. Patent No. 6,081,606).

Further, it appears that claims 4-6, 8-10, 12, 15-17, 19, 21, 23, 26-30, 33-37, and 39-43 were rejected for the same reasons provided in the prior office action. In other words, it appears that claims 4-6, 8-10, 15-17, 19, 21, 26-28, and 33-35 are indicated by the Examiner to be rejected under 35 U.S.C. §103(a) as being unpatentable over Uytendaele in view of Kanatani;

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and claims 23, 29-30, 36-37, and 42-43 are rejected under 35 U.S.C. §103(a) as being unpatentable over Uyttendaele in view of Kanatani as applied to claim 1 above, and further in view of Hansen (U.S. Patent No. 6,081,606).

Yet further, it is unclear from the Office Action what the actual rejection is for claims 24 and 31, although it appears that Uyttendaele (U.S. Patent No. 6,701,030) alone has been applied to claim 24. Claim 31 has been rejected for the same reasons as 24.

Still further, claim 38 has been rejected for the same reasons as claim 1. In other words, claim 38 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Uyttendaele in view of Kanatani and Hansen.

Applicant continues to respectfully traverse the rejections and believes that the previous remarks filed in response to the previous Office Action are sufficient to overcome such rejections. As such, these previous remarks are incorporated by reference herein and the following additional remarks are provided, particularly in response to the Examiner's Response to Arguments.

Please keep in mind that to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art references must teach or suggest all the claim limitations. See M.P.E.P. § 2143.

APPLICANT'S COMMENTS ON EXAMINER'S RESPONSE TO ARGUMENTS

Prior art references do not teach or suggest all the claim limitations

The Examiner alleges that "the panoramic image, i.e., the search area, is defined by two outer perimeters. In order for the six cameras (col. 7, lines 12-14 of Uyttendaele) to be placed correctly their positioning has to be defined by these outer perimeters or else the panoramic image will not look complete as some sections will end at higher locations than others."

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Uyttendaele describes the stitching of frames together to form a panoramic video (see column 8, lines 8-27). As indicated at column 7, lines 9-21, the system uses six cameras mounted on six faces of a cube resulting in a 360 degree by 360 degree field of view. Overlap in field of view for the cameras is described as being at least 20 percent (see column 7, lines 41-52). The stitching together process utilized in Uyttendaele is described in U.S. Patent No. 6,018,349, entitled "Patch Based Alignment Method and Apparatus For Construction of Image Mosaics" (see column 8, lines 8-27). The stitching process aligns the images using an incremental deformation of one image relative to a coordinate system and using a warping process described therein.

Uyttendaele does not describe "an entire search area defined by an outer perimeter edge." At most, Uyttendaele describes a panoramic video provided using six cameras mounted on six faces of a cube resulting in a 360 degree by 360 degree field of view. Although the panoramic image (e.g., not the search area to be monitored) has multiple edges, there is no description in Uyttendaele of a search area having an outer perimeter edge (i.e., perimeter being a boundary enclosing an area) that is to be covered by a plurality of imaging devices. In fact, a panoramic view is an unobstructed view extending in all directions.

The Examiner alleges that Uyttendaele creates the panoramic image and there is an upper and lower perimeter edge as a panoramic image can be considered a ring, which has two edges. The Examiner further alleges that either of such edges could be the outer perimeter edge. However, perimeter refers to a boundary enclosing an area. In the present invention, the area is a search area to be covered by imaging devices. There cannot be multiple perimeter edges for the same area, as alleged by the examiner. Neither of the perimeter edges alleged by the Examiner form the boundary enclosing an area, yet alone enclosing a search area. Such edges set forth by the Examiner would not be considered a boundary enclosing a search area as a panoramic view is an unobstructed view extending in all directions. Clearly, one of the edges does not provide a boundary commensurate to an outer perimeter edge of a search area.

As clearly stated in response to the previous Office Action, the Examiner's application of such a contrived edge of Uyttendaele to define an alleged search area is inappropriate. The

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present invention is focused at monitoring a defined search area; the definition of the finite search area is bounded by an outer perimeter edge (e.g., about the perimeter of the search area, or, in other words, a boundary enclosing an area). Imaging devices then are located to provide coverage of the entire defined search area. Uyttendaele does not provide such a defined search area (i.e., a search area that is defined by an outer perimeter edge).

The boundary of the defined search area according to the present invention is used to position the imaging devices. This is not the case in Uyttendaele as merely a complete ring of images to provide the 360 degree panoramic view (e.g., an unobstructed view extending in all directions) is desired.

Kanatani, rather than defining a search area, focuses on developing the homography between two images and nothing more. Hansen et al., also cited by the Examiner, also does not describe positioning of a plurality of imaging devices to cover a search area defined by an outer perimeter edge.

As such, all the limitations of each and every claim are not taught or suggested in the cited references. Therefore, such claims are not obvious in view of the references cited.

There is no suggestion or motivation to modify the reference or to combine reference teachings

Regarding claims 1 and 13, and all claims depending thereon

Uyttendaele is summarized above. Kanatani ("Optimal Homography Computation with a Reliability Measure", IAPR Workshop on Machine Vision Applications, Nov. 17-19, 1998) describes an algorithm for optimally computing the homography between two given sets of points on a plane. For example, the reference computes the homography between two images (see page 428) (e.g., an image of a rectangular region and ten points in it and an image of the same region viewed from above).

Providing a panoramic view is a much different imaging project than imaging a defined search area. Uyttendaele describes the stitching of frames together to form a panoramic video. The stitching together process of Uyttendaele aligns the images using an incremental

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deformation of one image relative to a coordinate system and using a warping process to combine the images.

Homography requires the identification of common points in the overlapping regions. Depending on the panoramic view being imaged (e.g., a sky portion that would be likely in an outdoor 360 degree panoramic view), it would be difficult to locate planar points in order to combine images using homography as described in Kanatani (e.g., it would be difficult to find common points in a view that had little three dimensional characteristics associated therewith). With a defined search area to be monitored as described according to the present invention (i.e., defined by an outer perimeter edge), physical locations for landmarks between fields of view can be employed to generate at least one homography transformation matrix.

In other words, Uyttendaele would not be modified to use homography in the generation of a panoramic view, as in many cases as described above, homography would not work. "The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggest the desirability of the combination." (*In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). In the present case, modification is not suggested. In fact, such modification, at least in the generation of certain panoramic images, would result in Uyttendaele being unsatisfactory for generating such an image (e.g., when it is difficult to locate planar points in order to combine images using homography). "If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification." (*In re Gordon*, 733 F.2d, 900, 221 USPQ 1125 (Fed. Cir. 1984).

As such, there is no teaching or suggestion in the references cited to combine the references to obtain the invention of claims 1 and 13. Therefore, such claims are not obvious in view of the references cited. Further, all the claims that respectively depend on one of the independent claims 1 or 13, either directly or indirectly, include the limitations of the respective independent claim upon which they depend. As such, and as described above, such claims are not obvious in view of the cited references for at least the same reasons as the independent claims, and by reason of their own limitations.

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For example, with respect to claim 2, there is no description in any of the references cited that physical markings in the search area defined by the outer perimeter edge are made in order to employ homography. The Examiner's assertion that a landmark is by its own definition a physical mark, is inappropriate as it is perfectly clear that the physical marking described in the present invention is (as stated and recognized by the Examiner in the Objection Section of this Office Action) physical marking on the ground during installation of the imaging devices and not preexisting landmarks.

With respect to claims 24, 31, and 38, and all claims depending thereon

In Uyttendaele, a panoramic view is provided by positioning of imaging devices about a cube. There is no need or teaching to position imaging devices at multiple installation sites as only a 360 degree panoramic view is provided about one point (e.g., all cameras are provided about one point). "The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggest the desirability of the combination." (*In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Positioning cameras at multiple sites in Uyttendaele would provide no discernible benefit to the generation of a panoramic image. As such, there is no motivation to provide imaging devices at multiple installation sites therein.

As such, for at least this reason, there is no teaching or suggestion in the references cited to combine the references to obtain the invention of claims 24, 31, and 38. Therefore, such claims are not obvious in view of the references cited. Further, claims depending on claims 24, 31, and 38, either directly or indirectly, include the limitations of the respective independent claim upon which they depend. As such, and as described above, such claims are not obvious in view of cited references for at least the same reasons as the independent claims, and it is respectfully requested that the rejection of such claims be withdrawn.

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It is respectfully submitted that the pending claims are in condition for allowance and notification to that effect is respectfully requested. The Examiner is invited to contact Applicant's Representatives, at the below-listed telephone number, if it is believed that prosecution of this application may be assisted thereby.

Respectfully submitted for

PAVLIDIS

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CERTIFICATE UNDER 37 CFR §1.8:

The undersigned hereby certifies that the Transmittal Letter and the paper(s), as described hereinabove, are being transmitted by facsimile in accordance with 37 CFR §1.6(d) to the Patent and Trademark Office, addressed to Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 22 day of Sept., 2005, at 3:35 pm (Central Time).

By: [Signature]
Name: Sandy Truehart